

**SOURCE WATER ASSESSMENT
EXECUTIVE SUMMARY
FOR
Bear Lodge**

June 30, 2004

PROJECT: 424-001

ASSESSMENT COMPLETED BY: TRIHYDRO CORPORATION

1252 Commerce Drive, Laramie, WY 82070



ENGINEERING SOLUTIONS. ADVANCING BUSINESS.

Home Office | 1252 Commerce Drive | Laramie, WY 82070 | phone 307/745.7474 | fax 307/745.7729 | www.trihydro.com

SOURCE WATER ASSESSMENT SUMMARY FOR Bear Lodge

PWS Source Water Assessment Summary

Bear Lodge water facility is as a non-community groundwater supply. The system serves an average of 100 people through five service connections year round. Facilities include a bladder tank and the distribution system. The water sources scored medium with respect to the combined integrity and aquifer sensitivity ratings. The lodge scored high with respect to land use, point source, and transportation corridor susceptibility.

Delineation Methods

This water system draws water from a fractured igneous formation. Hydrogeologic mapping methods were implemented to estimate the 2-year and 5-year time of travel for the groundwater flow system. The water system was mapped using well information in the sanitary survey and aquifer parameters were assumed for those of similar type deposits.

Hydrogeologic mapping techniques use surface observations in combination with subsurface geologic and hydrogeologic data to identify aquifer boundaries and areas that may contribute water to the aquifer. Mapping techniques were used when a PWS's source was derived from a spring, fractured bedrock, or from a limestone or dolomite aquifer. Conduit flow aquifers have extremely variable flow patterns and rates, making the calculation of time of travel difficult. In some instances, the entire aquifer may be delineated as the source water area if groundwater flow divides cannot be identified. Aquifer vulnerability mapping techniques were also used as part of the hydrogeologic mapping effort. Hydrogeologic mapping identifies vulnerable areas (faults, fractures, exposed bedrock, etc.) where groundwater within the aquifer may be more susceptible to the rapid infiltration of contaminants released at the ground surface.

Groundwater Sources

Bear Lodge draws water from a plutonic rock formation. Recharge for the wells originates as infiltrating precipitation and surface water from the surrounding drainage basin, and reaches the wells via fractured aquifer flow. Additional information on these wells is included on the attached Well Information Sheet. As shown on the enclosed source water area delineation map, contaminant inventory zones 2 and 3 were delineated by hydrogeologic mapping methods. Zone 2 boundaries include the immediate surface water drainage into the well. Zone 3 boundaries extend to the Tongue River on the northwest, a surface divide on the northeast and surface water drainages to the south.

Integrity Summary

Bear Lodge uses two wells that are approximately 74 feet and 80 feet deep. The Bear Lodge #1 well was constructed prior to 1983 when less stringent construction standards were required by the State of Wyoming. The Bear Lodge #2 well was constructed between 1983 and 1993 under moderately strict requirements. However, records show that both wells were properly sealed to protect against surface infiltration of potential contaminants and flooding around the wellhead. As shown on the Integrity Summary Table, Bear Lodge #1 received a score of 4 and Bear Lodge #2 received a score of 3.

Water Source Sensitivity Summary

As shown on the Source Sensitivity Summary Table, the wells received a sensitivity score of 10. The wells received this score for two reasons. First, the wells are completed in an aquifer that is known to be vulnerable to contamination because of the high velocities associated with conduit flow. Second, the wells scored 5 for chemical sensitivity due to documented detections in the groundwater.

Water System Susceptibility Rating

Susceptibility is defined as the potential for a public water supply to draw contaminated water at concentrations that would pose a threat or concern to human health. In general, Bear Lodge scores high for land use susceptibility because much of the land surrounding the water sources is forested. Forested areas were included to evaluate the potential risks of increased runoff and water quality problems following forest fires. The overall point source contaminant susceptibility rating is high due to the presence of one permitted underground injection facility within Zone 2 of the water sources. The water sources were assigned a high transportation corridor susceptibility score because their source water zones are in proximity to state highways. Susceptibility ratings for each type of potential contaminant source are summarized on the attached susceptibility tables.

A review of your PWS's routine water analysis results revealed that one or more chemicals that are considered contaminants in drinking water were detected at some time within the last five years. Chemical detections have a large impact on your PWS's sensitivity score because it may indicate that there is a pathway for contaminants to reach the water supply. However, it is likely that these chemicals are present only in small amounts and are not a danger to your health. Some of these chemicals may also occur naturally in water.

For more information about which chemicals were detected, please contact the PWS for a copy of the most recent Consumer Confidence Report or water analysis results. Chemical detections at levels that are a concern to human health are reported on the EPA's website: http://www.epa.gov/enviro/html/sdwis/sdwis_query.html. To see if your PWS has exceeded the federal primary or secondary drinking water standards, just click on the State of Wyoming and then type in the name of your PWS. Consumer Confidence Reports are prepared by the PWS on a yearly basis. The reports should include information about any chemicals found in the water, even those found at very low levels. Please contact Kim Parker at DEQ, 307-777-7781, or WARWS for assistance. You may also contact EPA to find out what contaminants were

detected. You may have to fill out a Freedom of Information Act request to obtain the water test results for your PWS. Please call EPA's Safe Drinking Water Hotline at 1-800-426-4791.

**POINT SUSCEPTIBILITY SUMMARY TABLE
FOR Bear Lodge
Point Source Susceptibility Summary**

It may appear from the results of this point source susceptibility summary table that your system has too many PSOCs influencing the final ratings. In some cases, a specific PSOC falls within a specific contaminant inventory zone shared by multiple wells or intakes. When this is the case, that PSOC will be scored for each intake. For example, an underground storage tank may appear within a contaminant inventory zone shared by four different wells. This would cause that single storage tank to be entered into the table four times, or once for each well or intake.

| Point Source Type | Low | Medium | High |
|-----------------------|-----|--------|------|
| Underground Injection | N/A | N/A | 2 |

- * Illustrates the number of PSOCs in a particular rating class for all water sources
- * N/A - Not Applicable